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09/988,940	11/21/2001	Chad Kendall	A363 0014	9171

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EXAMINER	
NGUYEN, TOAN D	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,940	KENDALL ET AL.	
	Examiner	Art Unit	
	Toan D. Nguyen	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18* is/are allowed.

6)☒ Claim(s) *1-5,8,9,12-23,25-27,30 and 31* is/are rejected.

7)☒ Claim(s) *6,7,10,11,24,28 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/9/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-2, 4 and 9 are objected to because of the following informalities:

In claim 1 line 6, it is suggested to change "each transmit channel" to --- each said transmit channel ---.

In claim 1 line 8, it is suggested to change "for each channel" to --- for each said transmit channel ---.

In claim 1 line 13, it is suggested to change "the transmit control circuit" to --- the first transmit control circuit ---.

In claim 2 line 1, it is suggested to change "the transmitting devices" to --- the data transmitting devices ---.

In claim 4 line 5, it is suggested to change "the channels" to --- the receive channels ---.

In claim 9 line 2, it is suggested to change "the receiver" to --- the second receiver ---.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 8-9, 12-17, 19-23, 25, 27, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delvaux (US 6,775,305) in view of Khotimsky et al. (US 6,788,686).

For claim 1, Delvaux discloses system and method for combining multiple physical layer transport links, comprising:

a) a first demultiplexer (figure 8, reference 144a) connected to receive the data stream (col. 16 lines 14-15) and to split the data stream (col. 16 lines 16-18) by delivering the cells in rotation into a plurality of N transmit channels so that each transmit channel carries every N^{th} cell (col. 2 lines 42-45);

b) for each channel a data transmitting device (figure 8, reference 143) connected to receive the cells of the transmit channel (figure 8, reference 146) and to output the cells on one or more data connections carrying data in a first direction to a receiver (figure 8, reference 144b) (col. 16 line 37 to col. 17 line 28).

However, Delvaux does not expressly disclose:

c) a first transmit control circuit connected to the data transmitting devices, the transmit control circuit configured to cause the transmitting devices to output the cells in sequence with the commencement of transmission of cells on sequential transmit channels staggered in time relative to one another by a time difference T.

In an analogous art, Khotimsky et al. disclose:

c) a first transmit control circuit connected to the data transmitting devices (figure 3, reference 40), the transmit control circuit configured to cause the transmitting devices to output the cells in sequence with the commencement of transmission of cells on

sequential transmit channels staggered in time relative to one another by a time difference T (col. 6 lines 26-33 and col. 7 lines 5-6).

One skilled in the art would have recognized a first transmit control circuit, and would have applied Khotimsky et al.'s control circuit in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to provide a controller acts as an inverse multiplexor (demultiplexor) with respect to the inbound split traffic streams and as a resequencer (or multiplexor) with respect to the outbound streams (col. 4 lines 4-6).

For claims 2 and 8-9, Delvaux discloses wherein the transmitting devices each comprise a serializer device and the data connections comprise serial data connections (figure 8, reference 143, col. 16 line 61 to col. 17 line 3).

For claims 3-5, Delvaux discloses a first receive interface for receiving a data stream, the first receive interface comprising:

a) a plurality of deserializer devices for receiving one or more serial streams of cells in each of a plurality of receive channels (col. 17 lines 25-28).

However, Delvaux does not expressly disclose:

b) a first receive control circuit configured to determine a sequence of arrival of the cells and to place the cells onto a bus in the sequence of arrival.

In an analogous art, Khotimsky et al. disclose:

b) a first receive control circuit configured to determine a sequence of arrival of the cells and to place the cells onto a bus in the sequence of arrival (col. 4 lines 2-6 and col. 6 lines 26-33). Khotimsky et al. disclose wherein one or more of the receive channels (figure 3, references P0-P3) carries a flow control signal, the first receive control circuit is configured to provide the flow control signal to the first transmit control circuit (figure 3, reference 40) and the first transmit control circuit (figure 3, reference 40) is configured to inhibit the output of cells on one or more of the channels in response to the flow control signal (col. 6 lines 26-33 as set forth in claim 4); wherein the first receive control circuit (figure 3, reference 40) is configured to demultiplex the flow control signal from the stream of cells in one of the receive channels (col. 6 lines 26-33 as set forth in claim 5).

One skilled in the art would have recognized a first receive control circuit, and would have applied Khotimsky et al.'s a first receive control circuit in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to provide a controller acts as an inverse multiplexor (demultiplexor) with respect to the inbound split traffic streams and as a resequencer (or multiplexor) with respect to the outbound streams (col. 4 lines 4-6).

For claim 12, Delvaux discloses system and method for combining multiple physical layer transport links, comprising:

a) means for carrying a data stream comprising a sequence of cells in an order (figure 8, col. 16 lines 37-60);

b) demultiplexing means (figure 8, reference 144a) for assigning each of the cells of the data stream to one of a plurality of channels (figure 8, reference 146) (col. 16 line 61 to col. 17 line 8);

c) transmitting means for transmitting the cells in each channel to a receiver (figure 8, reference 144b) (col. 17 lines 25-28).

However, Delvaux does not expressly disclose:

d) control means for commencing the transmission of individual cells to the receiver, in the order, at times staggered relative to one another by a time difference AT.

In an analogous art, Khotimsky et al. disclose:

d) control means (figure 3, reference 40) for commencing the transmission of individual cells to the receiver, in the order, at times staggered relative to one another by a time difference T (col. 6 lines 26-33 and col. 7 lines 5-6).

One skilled in the art would have recognized control means, and would have applied Khotimsky et al.'s control circuit in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to provide a controller acts as an inverse multiplexor (demultiplexor) with respect to the inbound

split traffic streams and as a resequencer (or multiplexor) with respect to the outbound streams (col. 4 lines 4-6).

For claim 13, Delvaux discloses wherein the transmitting means comprises means for serially transmitting the cells in each channel to a receiver (figure 8, col. 16 line 49 to col. 17 line 28).

For claim 14, Delvaux discloses means for receiving a plurality of serially transmitted cells in a plurality of channels and means for determining an order of arrival of the plurality of cells (figure 8, col. 16 line 49 to col. 17 line 28).

For claims 15 and 16, Delvaux discloses a first receive interface for receiving a data stream, the first receive interface comprising a plurality of receiving devices each for receiving a stream of cells in one of a plurality of channels (figure 8, col. 16 line 49 to col. 17 line 28).

However, Delvaux does not expressly disclose a first receive control circuit configured to determine a sequence of arrival of the cells and to place the cells onto a bus in the sequence of arrival.

In an analogous art, Khotimsky et al. disclose a first receive control circuit configured to determine a sequence of arrival of the cells and to place the cells onto a bus in the sequence of arrival (col. 4 lines 2-6 and col. 6 lines 26-33).

Khotimsky et al. disclose wherein the first receive interface is adapted to receive in the data stream a first direction flow control signal and the first transmit control circuit

is connected to receive the flow control signal and adapted to selectively enable or inhibit the transmission of cells by one of the data transmission devices in response to the flow control signal (col. 6 lines 26-33 as set forth in claim 16).

One skilled in the art would have recognized a first receive control circuit, and would have applied Khotimsky et al.'s a first receive control circuit in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to provide a controller acts as an inverse multiplexor (demultiplexor) with respect to the inbound split traffic streams and as a resequencer (or multiplexor) with respect to the outbound streams (col. 4 lines 4-6).

For claims 19 and 21, Delvaux discloses system and method for combining multiple physical layer transport links, comprising:

a) assigning consecutive cells of the data stream into different ones of a plurality of channels (figure 8, reference 146) (col. 16 line 61 to col. 17 line 8).

However, Delvaux does not expressly disclose:

b) simultaneously transmitting to the receiver data on each of the channels while staggering transmission of consecutive ones of the cells in time relative to one another by a time difference T.

In an analogous art, Khotimsky et al. disclose:

b) simultaneously transmitting to the receiver data on each of the channels (figure 4, references P0-P3) while staggering transmission of consecutive ones of the cells in time relative to one another by a time difference T (col. 6 lines 26-30 and col. 7 lines 5-6).

One skilled in the art would have recognized simultaneously transmitting to the receiver data on each of the channels while staggering transmission of consecutive ones of the cells in time relative to one another by a time difference T, and would have applied Khotimsky et al.'s control circuit in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to perform end-to-end connection splitting on cell-by-cell basis (col. 7 lines 4-5).

For claims 20 and 27, Delvaux discloses comprising serializing the data of each channel before transmitting the data of the channel (figure 8, reference 143) (col. 16 line 61 to col. 17 line 3).

For claim 22, Delvaux discloses wherein transmitting the serialized data for each channel comprises transmitting a plurality of streams of serial data (figure 8, col. 16 lines 49-64).

For claim 23, Delvaux discloses comprising receiving a flow control signal and inhibiting the transmission of cells in at least one of the channels in response to the flow control signal (col. 16 lines 34-36).

For claim 25, Delvaux discloses for at least one channel, multiplexing flow control signals with the serialized data before transmitting the serialized data (figure 8, col. 16 lines 61-64).

For claim 30, Delvaux discloses system and method for combining multiple physical layer transport links, comprising:

assigning each of the cells to one of a plurality of channels in rotation (col. 2 lines 42-45), each of the channels having a recurring cell transmit time (col. 16 lines 49-60);

in each channel (figure 8, reference 146), transmitting the cells in sequence to the receiving device over one or more serial data connections (figure 8, reference 145) and commencing transmission of each cell only at the cell transmit time for that channel (col. 17 lines 9-31 and col. 18 lines 28-30).

However, Delvaux does not expressly disclose:

the cell transmit times for successive channels staggered relative to one another by amounts exceeding any inter-channel differences in skew and latency.

In an analogous art, Khotimsky et al. disclose:

the cell transmit times for successive channels staggered relative to one another by amounts exceeding any inter-channel differences in skew and latency (col. 2 lines 8-14).

One skilled in the art would have recognized the cell transmit times for successive channels staggered relative to one another by amounts exceeding any inter-channel differences in skew and latency, and would have applied Khotimsky et al.'s re-assembly engine in Delvaux's multi-channel communication link. Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention, to use Khotimsky et al.'s method of maintaining packet order multipath transmission system having non-uniform traffic splitting in Delvaux's system and method for combining multiple physical layer transport links with the motivation being to provide a re-assembly engine at the receiving end, and the re-assembly engine be able to buffer each channel's data to allow for correct reconstruction of the aggregate flow (col. 2 lines 12-14).

For claim 31, Delvaux discloses receiving and deserializing the transmitted cells at a receiving device, and detecting an order of arrival of the cells at the receiving device (col. 17 lines 25-31).

4. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delvaux (US 6,775,305) in view of Khotimsky et al. (US 6,788,686) further in view of McKeown et al. (US 6,647,019).

For claim 26, Delvaux in view of Khotimsky et al. does not expressly disclose wherein the sequence of cells comprises an OC-192 data stream. In an analogous art, McKeown et al. disclose wherein the sequence of cells comprises an OC-192 data stream (col. 8 lines 66-67).

One skilled in the art would have recognized an OC-192 data stream, and would have applied McKeown et al.'s line card in Delvaux's multi-channel communication link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use McKeown et al.'spacket-switch system in Delvaux's system and

method for combining multiple physical layer transport links with the motivation being received an ATM cell from an external OC-192 line (col. 8 lines 66-67).

Allowable Subject Matter

5. Claims 6-7, 10-11, 24 and 28-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claim 18 is allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 18, the prior art fails to teach a combination of the steps of:

for each second direction channel a serializer device connected to receive the cells of the second direction channel and to output the cells as serial data on one or more serial data connections extending through the midplane to the line card;

a second transmit control circuit connected to the serializer devices, the transmit control circuit configured to cause the serializer devices to output the cells in sequence order with the commencement of transmission of cells on different second direction channels staggered in time relative to one another by a time difference T;

a plurality of second deserializer devices at the line card, the deserializer devices connected to receive and deserialize the serial data on the serial data connections; and

a second direction receive control circuit connected to detect an order of arrival of cells on the serial data connections and to place the cells into a received data stream in the order of arrival, in the specific combination as recited in the claim.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan D. Nguyen whose telephone number is 571-272-3153. The examiner can normally be reached on M-F (7:00AM-4:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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